»Kontron User's Guide«

OM5080

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Customer Service

Contact Information:

Kontron Canada, Inc.
4555 Ambroise-Lafortune
Boisbriand, Québec, Canada
J7H 0A4
Tel: (450) 437-5682
(800) 354-4223
Fax: (450) 437-8053
E-mail: support@ca.kontron.com

Kontron Modular Computer GMBH
Sudetenstrasse 7
87600 Kaufbeuren
Germany
+49 (0) 8341 803 333

+49 (0) 8341 803 339
support-kom@kontron.com

Visit our site at: www.kontron.com

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Kontron reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology. Changes that affect the operation of the unit will be documented in the next revision of this user's guide.

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Safety Instructions

Before You Begin

Before handling the system, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisory Conventions" section in the Preface for advisory conventions used in this user's guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics service personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user's guide for precautions and procedures. If you have any questions, please contact Kontron Technical Support

WARNING

High voltages are present inside the chassis when the unit's powered.

Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Kontron strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

Take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.
- When you want to remove the protective foil (if present), make sure you are properly grounded and that you touch a metalic part of the board.

CAUTION

The back cover offers only a mechanical protection of the bottom components. The board should always be manipulated following proper ESD practices to avoid damages caused by static discharge

Preface

How to Use This Guide

This user's guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

For the circuits, descriptions and tables indicated, Kontron assumes no responsibility as far as patents or other rights of third parties are concerned.

The following is a summary of chapter contents:

- Chapter 1, Product Description
- Chapter 2, System Features
- Chapter 3, Installation
- Chapter 4, System Management
- Chapter 5, Updating the System
- Appendix A, Getting Help
- Appendix B, Glossary

Customer Comments

If you have any difficulties using this user's guide, discover an error, or just want to provide some feedback, please send a message to: Tech.Writer@ca.kontron.com. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user's guide on our Web site.

Advisory Conventions

Seven types of advisories are used throughout the user guides to provide helpful information or to alert you to the potential for hardware damage or personal injury. They are Note, Signal Paths, Jumpers Settings, BIOS Settings, Software Usage, Cautions, and Warnings. The following is an example of each type of advisory. Use caution when servicing electrical components.

Note:
Indicate information that is important for you to know.

CAUTION
Indicate potential damage to hardware and tells you how to avoid the problem.

WARNING
Indicates potential for bodily harm and tells you how to avoid the problem.

ESD Sensitive Device:
This symbol and title inform that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.
Please read also the section "Special Handling and Unpacking Instructions".

CE Conformity:
This symbol indicates that the product described in this manual is in compliance with all applied CE standards. Please refer also to the section "Regulatory Compliance Statements" in this manual.

Disclaimer: We have tried to identify all situations that may pose a warning or a caution condition in this user's guide. However, Kontron does not claim to have covered all situations that might require the use of a Caution or a Warning.

Unpacking

Follow these recommendations while unpacking:

- Remove all items from the boxes. If any items listed on the purchase order are missing, notify Kontron customer service immediately.
- Inspect the product for damage. If there is damage, notify Kontron customer service immediately.
- Save the box and packing material for possible future shipment.

System Installation

The system have been designed to be installed in a rackmount shelf. The chassis can be used on a ESD safe table or bench. It is not recommanded to put heavy objects on the top of this chassis; it has not been designed to support such weight.

Powering Up the System

Before any installation or setup, ensure that the board is unplugged from power sources or subsystems.

If you encounter a problem, verify the following items:

- Make sure that all connectors are properly connected.
- If the system does not start properly, try booting without any other I/O peripherals attached.

Make sure your system provides the minimum DC voltages required at the board's slot, especially if DC power is carried by cables.

If you are still not able to get your board running, contact our Technical Support for assistance.

Adapter Cables

Because adapter cables come from various manufacturers, pinouts can differ. The direct crimp design offered by Kontron allows the simplest cable assembly. All cables are available from Kontron Sales Department.

Storing Boards

Electronic systems and boards are sensitive devices. Do not handle or store device near strong electrostatic, electromagnetic, magnetic or radioactive fields.

Regulatory Compliance Statements

FCC Compliance Statement for Class B Devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generated, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experience radio/TV technician for help.

WARNING

This is a Class B product. If not installed in a properly shielded enclosure and used in accordance with this User's Guide, this product may cause radio interference in which case users may need to take additional measures at their own expense.

Safety Certification

All Kontron equipment meets or exceeds safety requirements based on the IEC/EN/UL/CSA 60950-1 family of standards entitled, "Safety of information technology equipment." All components are chosen to reduce fire hazards and provide insulation and protection where necessary. Testing and reports when required are performed under the international IECEE CB Scheme. Please consult the "Kontron Safety Conformity Policy Guide" for more information. For Canada and USA input voltage must not exceed -60Vdc for safety compliance.

CE Certification

The product(s) described in this user's guide complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques. Although Kontron offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. Kontron does not offer engineering services for designing cabling systems. In addition, Kontron will not retest or recertify systems or components that have been reconfigured by customers.

Limited Warranty

Kontron grants the original purchaser of Kontron's products a TWO YEAR LIMITED HARDWARE WARRANTY as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of Kontron are valid unless the consumer has the express written consent of Kontron.

Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long- term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than Kontron or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.

Chapter 1

Product Description

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1. Product Description

1.1 Product Overview

The OM5080 is available as a pre-configured system ready for customization and deployment. It is a highly space and cost efficient managed system, which can store up to 8 AMCs and coming in 1G or 10G configuration. The enclosure is a 2U AdvancedTCAlike chassis. The hot-swappable managed fans and the power supply are both redundant. An optional AC power supply can be used, taking one of the RTM slots. The -48V DC powered version allows the usage of two RTMs for additional storage, GbE, management and AMC uplink connectivity. The Carriers host a special software version which provides part of the system management functions.

The 1G Version uses two Kontron AT8402 Carrier blades. Those Carrier boards are linked together with a speed up to 8x GbE, which allows a fast and fully redundant configuration. Each AMC Carrier connects to one Uplink Module with 2 Base Interface links and 2x GbE Fabric links. The link speed between a Carrier and an AMC can be up to 2xGbE. The AMC Carrier contains a managed switch which includes VLAN, QoS and traffic management. For system and switch configuration, each switch controller provides a serial port (RS232) on the front and an inband access over Ethernet on the Uplink Modules (incl. IPMI over LAN) or a Fast Ethernet link with the optional RTM.

The 10G version uses 10 GbE Uplink Modules and Kontron AT8404 Carrier blades. System management remains identical to the 1G version. Each AMC Carrier connects to one Uplink Module with 2x GbE and one 10 GbE uplinks. The Carrier provide to each AMC up to 5x GbE links. The chassis backplane is identical to the 1G version, however, the AMC Carrier boards in this case interlink through a 10GbE interface.

1.2 What's Included

This system is shipped with the following items:

- One 2U 2-slot chassis with the power cable kit
- One Management Module
- Zero, one or two Uplink Modules, depending on your system configuration.
- One or two AT840x with their serial cable, depending on your system configuration.
- AMC cards specific to your configuration
- Filler panels for empty AMC bays

If any item is missing or damaged, contact Kontron Technical Support.

1.3 Technical Specifications

1.3.1 Physical Dimensions

- 19” – 2U height – 415 mm depth

1.3.2 Platform Features

- 8 mid-size AMC slots on front
- Fan trays and air filter on front
- Uplink Modules on front
- Management Module on front
- DC inputs on the rear
- Dual slots for RTMs or one AC Power Supply and one RTM
- Push-Pull side cooling

1.3.3 Standards Compliancy

- AMC.0 R2, AMC.1 PCIe, AMC.2 Ethernet, AMC.3 Storage
- MicroTCA compliant, AMC bays to be used with MicroTCA / AMC compliant Modules
- System Management: IPMI 1.5
- No MicroTCA Power Modules and Cooling Units
- MCH and Management functionality present on AMC Carriers

1.3.4 Environmental & Regulatory

- Designed to meet NEBS level 3 (GR-63, GR1089, Telcordia SR-3580), ETS 300 019, ETS 300 132, ETS 300 753 (Europe)
- Safety: Test report according to IEC 60950-1, complies with EN/CSA/ UL 60950-1
- EMC: FCC 47 CFR Part 15, Subpart B (USA), EMC Directive 89/336/EEC (Europe), EN55022 (Europe), EN55024 (Europe), CISPR22, VCCI (Japan), EN 300 386
- Vibration/Shock: IEC60068-2-6/EIC60068-2-27
- Climatic Humidity: IEC60068-2-78
- WEEE: Directive 2002/96/EC
- RoHS: Directive 2002/95/EC

Chapter 2

System Features

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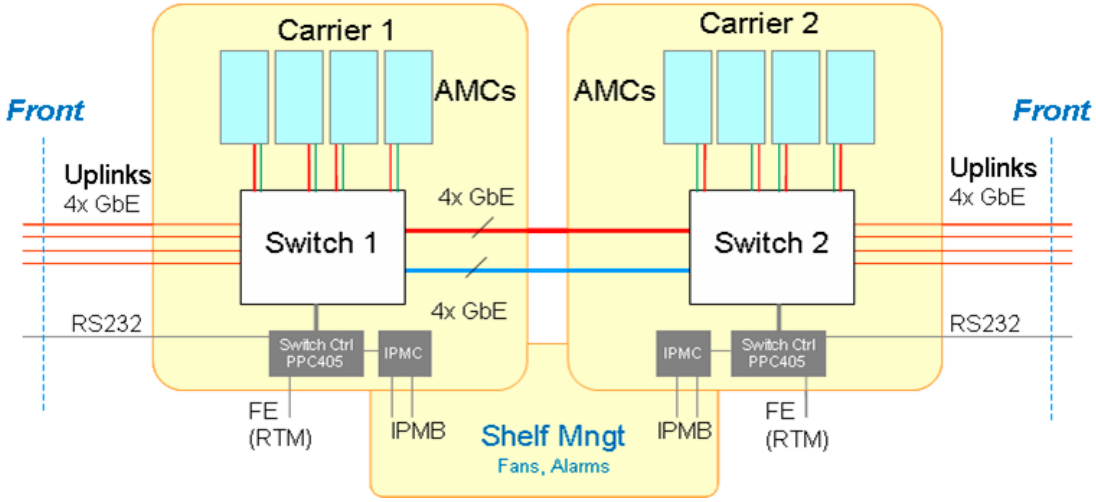
2. System Features

2.1 Hardware Components

2.1.1 Block Diagrams

Figure 2-1:Block Diagram OM5080-1G

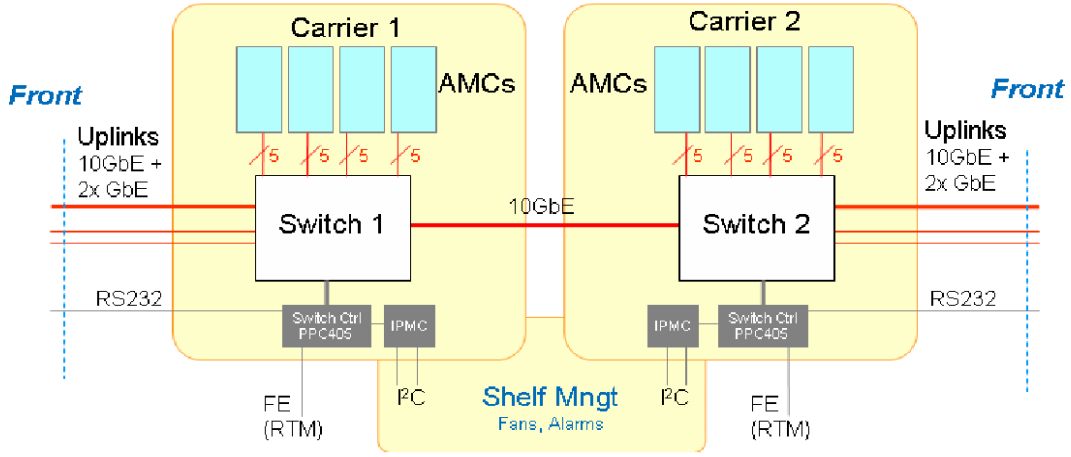


Other functions provided by the AT8402 Carrier boards which are not shown in the block diagram are:

- PCIe x4 between AMCs and between Carriers (via update channel)
- SAS/SATA between AMCs and between Carriers via RTMs
- 2 RTM slots e.g. for E1/T1, STM-1/OC3, SAS to external storage entities and other interfaces

Please have a look on the AT8402 manual for more information on those features.

Figure 2-2:Block Diagram OM5080-10G



Other functions provided by the AT8404 Carrier boards which are not shown in the block diagram are:

- Fat Pipe interconnect between paired slots (PCIe, SRIO)
- 1x 2.5Gbs APS link per AMCs between the Carriers (via update channel)
- SAS/SATA between AMCs and between Carriers via RTMs
- 2 RTM slots e.g. for E1/T1, STM-1/OC3 and other interfaces

Please have a look on the AT8404 manual for more information on those features.

2.1.2 Chassis

The OM5080 is contained in a 19" chassis of 2U height and 415 mm depth (DC version). Most modules and connectors are accessible on the front, which facilitates deployment and field operation.

Management Module, 2 Uplink Modules, 2 AMC Carrier slots, both fan trays and the air filter are all on the front side.

The rear contains the dual DC Power Feeds (PEMs) and 2 slots which can be used for RTMs or alternatively for one AC Power Supplies and one RTM

Management Module includes: LEDs and connector for Telco Alarms, LEDs for fans and Management Module health status.

2.1.2.1 Fan Tray

The 2 Slots ATCA Shelf contains two identical and interchangeable fan trays arranged in a side to side configuration. One is plugged-in at the left and the other at the right in front of the Shelf.

They are non-intelligent FRUs controlled by the Management Module.

All the fans are controlled as a group.

Each fan tray is locked into the Shelf by a mini compression latch with indicator and they contains three 80 mm fans (69 m^3/h each) and one 40 mm fan (28 m^3/h)

Others caracteristics:

- 2 x 3 fans (24V)
- Fans are current monitored, voltage controlled
- Fan tray presence sensor
- Hot swappable
- Five fan speed levels (0 to 4)
- Cooling from right to left when facing front

2.1.2.2 Air Filter

The ATCA Shelf has a front replaceable air filter. The filter element is an open cell polyurethane foam special coating to provide improved fire retardation and fungi resistance. The filter meets the requirements of the Telcordia Technologies Generic Requirements GR-78-CORE specification.

The air filter presence is detected by a read sensor switch located on the Backplane.

Chapter 3 contains a section explaining how to maintain your system, especially air filters.

2.1.3 Backplane

The 2-slot ATCA monolithic backplane was specifically designed to provide:

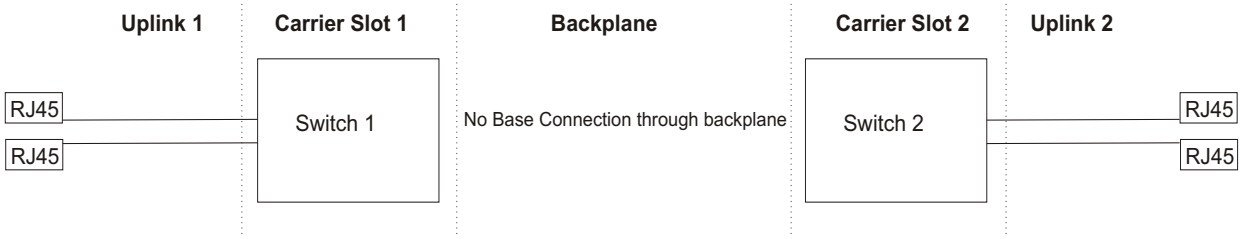
- 2 ATCA slots
- 2 RTM slots
- 1 dedicated slot for a System Management Controller
- 2 dedicated slots for Uplink Modules (1G or 10G)
- 2 slots for the fan trays

2.1.3.1 IPMB

- The Shelf uses an Intelligent Platform Management Bus (redundant A and B IPMB) for management communications among all ATCA Carriers and the Management Module (SMC).

2.1.3.2 Base Interface (BI)

Figure 2-3:Base Interface Configuration



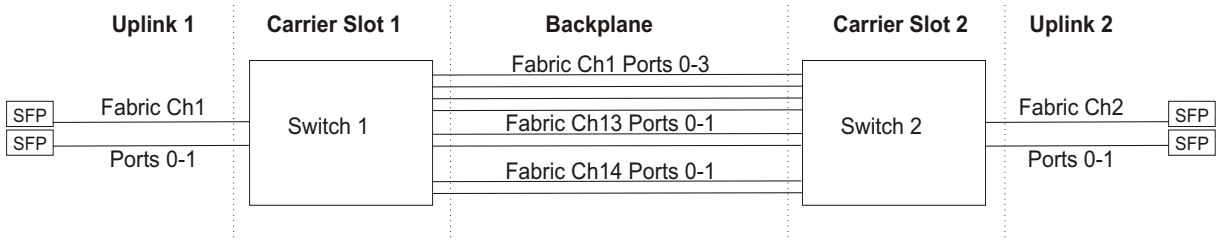
- Slot 1(Bottom slot) Base Interface (BI) Channel 1 and Channel 2 are routed to Uplink Module 1.
- Slot 2(Top slot) Base Interface (BI) Channel 1 and Channel 2 are routed to Uplink Module 2.
- There is no Base Interface link between the Carrier slots.

2.1.3.3 Fabric Interface

2.1.3.3.1 1G Backplane Fabric Configuration :

- Fabric Interface (FI) Channel 1 (Ports 0 to 3) of slot 1 is routed to the respective Fabric Channel of slot 2.
- Fabric Interface (FI) Channel 13 (Ports 0 to 1) of slot 1 is routed to the respective Fabric Channel of slot 2.
- Fabric Interface (FI) Channel 14 (Ports 0 to 1) of slot 1 is routed to the respective Fabric Channel of slot 2.
- Fabric Interface (FI) Channel 2 (Ports 0 to 1) of slot 1 is routed to Uplink Module 1.
- Fabric Interface (FI) Channel 2 (Ports 0 to 1) of slot 2 is routed to Uplink Module 2.

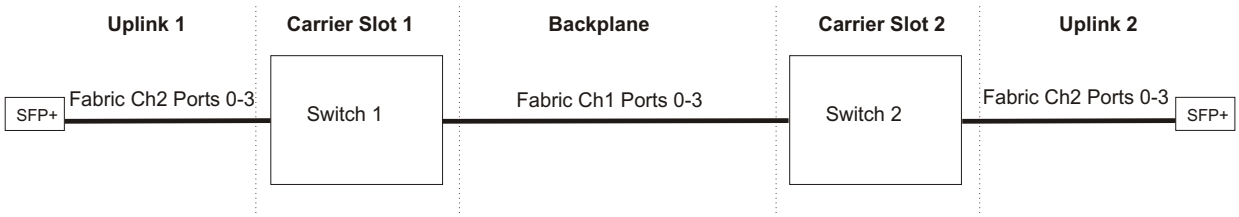
Figure 2-4:1G Configuration



2.1.3.3.2 10G Backplane Fabric Configuration :

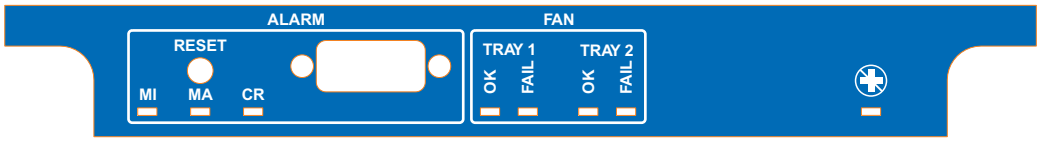
- Fabric Interface (FI) Channel 1 (Ports 0 to 3) of slot 1 is routed to the respective Fabric Channel of slot 2.
- Fabric Interface (FI) Channel 2 (Ports 0 to 3) of slot 1 is routed to Uplink Module 1.
- Fabric Interface (FI) Channel 2 (Ports 0 to 3) of slot 2 is routed to Uplink Module 2.

Figure 2-5:10G Configuration



2.1.4 Management Module

Figure 2-6:Management Module



The Management Module provides control over the fan trays, provides support for the Telco alarm functions (with additional external hardware) and provides I²C raw access to Uplink Modules. It is a 3 HP front module and its features are:

- Redundant Power supply circuits
- Redundant fan Controllers
- Shelf Alarm Panel Functions (Alarm connector, fan OK and failure LEDs, Alarm LEDs (minor, major, critical), I²C based)
- Inlet temperature based fan control and I²C based monitoring
- 2-Wire (I²C) interconnects to Uplink Modules
- Access to sensors and FRU data storages via the backplane, sensors on Uplink Modules
- Redundant IPMB through backplane to blades
- Redundant -48V power supply connector
- Software: IPMI version 1.5 for module level management, HPM.1 compatible firmware
- Field replaceble (not hot-swappable)

2.1.4.1 Telco Connector

The SMC provides Telco Alarm support for control by an external System Manager. Please refer to section 4.2.7 for more details.

2.1.5 Uplink Module

Figure 2-7:1G Uplink Module

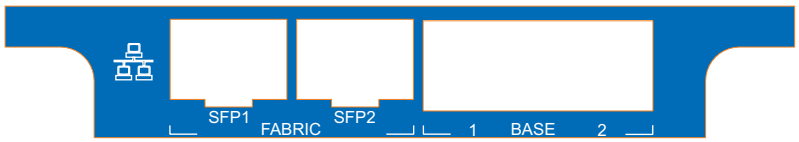


Figure 2-8:10G Uplink Module

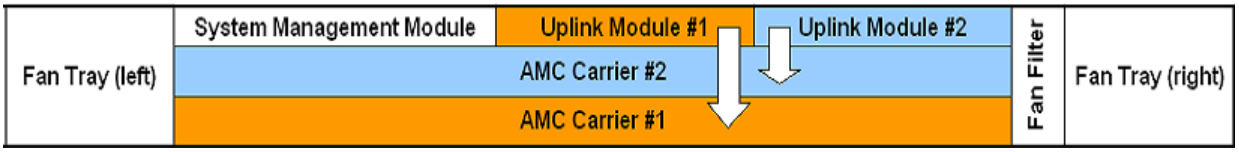
Each AMC Carrier board is linked to its own Uplink Module with 2x 10/100/1000Base-T on their Base Interface. They are accessible through RJ45 connectors. In addition, the 1G version Carrier board is linked to its Uplink Module with 2x 1GbE links. Alternatively, the 10G version Carrier board is linked to its Uplink Module with one 10GbE link. Those links give access to the FI through SFP or SFP+ connectors respectively. In summary, the Uplink Module features are:

- 3 HP Front I/O
- 2x BI 10/100/1000Base-T RJ45
- 2x FI 1000Base-X, SFP transceiver (1G Version)
- 1x 10GBase-X SFP+ transceiver (10G Version)
- Redundant -48V power supply connector
- 2-Wire (I^2C) interconnects to Management Module
- Present and activity signals to the Management Module
- Hot Swap
- IPMB-0 support (optional)

Table 2-1:Uplink Modules Connector Types

Speed	Base Interface 1	Base Interface 2	Fabric Interface 1	Fabric Interface 2
1G	RJ-45	RJ-45	SFP (Fibre/Copper)	SFP (Fibre/Copper)
10G	RJ-45	RJ-45	Backplane	SFP+ (Fibre/Copper)

Figure 2-9:Uplink Modules Slot Mapping



The SFP and SFP+ modules required for the operation of the Fabric Uplink Ports are not provided with the OM5080 and must be purchased separately.The SFP uplink ports meet all requirements specified by the Small Form-factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA), Sept. 14th, 2000. Consult the table below for a list of validated SFP and SFP+ modules. For more details, a Whitepaper is available on Kontron's ftp site.

Table 2-2:List of SFP Modules

Standard	Vendor	Model
1000Base-SX	Agilent	HFBR 5710LP
	Infineon	V23818-M305-B57
1000Base-LX	Agilent	HFCT 5710LP
	Finisar	FTRJ1319P1BLT

Table 2-3:List of SFP+ Modules

Standard	Vendor	Model
10GBase-SR (Short Wavelength Serial)	Finisar	FTLX8571D3BCL
	Opnext	TRS2000EN
10GBase-LR (Long Wavelength Serial)	Finisar	FTLX1471D3BCL
	Opnext	TRS5020EN

CAUTION

Do not look into the laser beam!
The SFP and SFP+ modules are fitted with a class 1 or 1M laser. To avoid possible exposure to hazardous levels of invisible laser radiation, do not exceed maximum ratings.

2.2 Software Components

2.2.1 Extra-Profile

The extra-profile adds extra software functionality to Carriers. It resides on each Carrier unit computer (PQ3). Extra-profile content is:

- /etc/om5080release
- /etc/fan-settings.template
- /etc/init.d/rc.custom
- /opt/kontron/bin/fanctrl
- /opt/kontron/bin/ipmitool
- /opt/kontron/bin/sfptool
- /usr/bin/ipmilan

To apply the extra-profile, please refer to the procedure located in the Extra-Profile section of the OM5080 product web page.

2.2.2 IPMI over LAN (IOL)

On OM5080 carrier blades, the Extra-profile contains a special “ipmilan” application that can bridge IPMI commands transparently to the other blade and to the SMC. To do so, a port is necessary after the host name. It specifies to which unit the IPMI command is sent.

Port usage is:

- Port 623: slot 1 blade
- Port 1623: SMC
- Port 2623: slot 2 blade

Example IPMI over LAN command from a remote server:

```
ipmitool –H 192.168.10.1 –p 2623 –U "" –P "" picmg portstate getall
```

Note:
IP address shown here corresponds to PQ3 Base Interface. This specific IP address is an example only.

2.2.3 IPMB-0 Addresses

IPMB-0 connection is used as the primary management interface.

The SMC implements the System Event Log (SEL), which gathers IPMI events for the entire OM5080 system.

IPMB-0 addresses are:

- SMC: 0x20
- Slot 1 Carrier: 0x82
- Slot 2 Carrier: 0x84
- SEEPROM containing chassis FRU Data: 0xFE

Chapter 3

Installation & Operations

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3. Installation & Operations

The OM5080 consists of a chassis with several modules already installed. This chapter describes how the system is assembled and put into operation. The following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to preclude damage to the board, other system components, or injury to personnel.

3.1 Safety Requirements

The following safety precautions must be observed when installing or operating the OM5080. Kontron assumes no responsibility for any damage resulting from failure to comply with these requirements.

WARNING

Due care should be exercised when handling the board due to the fact that the heat sink can get very hot. Do not touch the heat sink when installing or removing the board.
In addition, the board should not be placed on any surface or in any form of storage container until such time as the board and heat sink have cooled down to room temperature.

Note:

Certain ATCA boards require bus master and/or rear I/O capability. If you are in doubt whether such features are required for the board you intend to install, please check your specific board and/or system documentation to make sure that your system is provided with an appropriate free slot in which to insert the board.

ESD Equipment:

This ATCA board contains electrostatic sensitive devices. Please observe the necessary precautions to avoid damage to your board:

- Discharge your cloths
- Thing before touching the assembly. Tools must be discharged before use.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Do not touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

3.2 Shelf Ground Connection

WARNING HAZARDOUS VOLTAGE

Before powering-up the Shelf, make sure that the Shelf Ground terminals are connected to Protective Earth (PE) of the building.

Note:

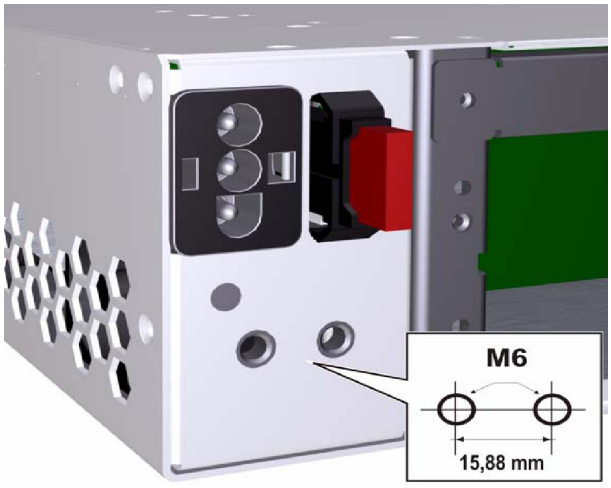
Please note, that in a typical telecom environment, the VRTN path of the -48 V supply is grounded to Protective Earth (PE) of the building.

Note:

Logic ground and shelf ground are connected by default.

The ATCA Shelf provides a Shelf ground terminal at the left rear side.The Shelf ground terminal provides two threads (M6) with a 15.88 mm spacing between thread centers to connect a double-lug Shelf ground terminal cable.

Figure 3-1:Shelf Ground Terminal



3.2.1 Specification for the Shelf Ground connection cable

- Required wire size: AWG 10
- Required terminals: Use only double lug terminals.

3.3 Assembly

The modules contained in the OM5080 are pre-configured. For unimpaired operation, it is necessary to operate each module in its dedicated slot.

To facilitate the assembly process, Kontron provides an assembly sheet. This sheet shows the chassis and the location of all the components with their serial number. See Figure 3-2 for an example

Figure 3-2:Assembly Sheet Example

OM5080 Assembly Instructions

Your system has been partially disassembled before being shipped in order to preserve it from any damage during transportation. Please make sure to reinstall all boards in their exact location as described in the following chart. Part number and serial number must match. Fan Trays and Fan Filter are shipped within the chassis.

Component Layout

Fan Tray (left)	Management Module		Uplink Module #1	Uplink Module #2	Fan Filter	Fan Tray (right)
	AMC: B1	AMC: B2	AMC: B3	AMC: B4		
	Slot 2					
	AMC: B1	AMC: B2	AMC: B3	AMC: B4		
	Slot 1					

Product Name / Description	Location	Part Number	Serial Number
Chassis:		"P/N"	"S/N"
Management Module:		"P/N"	"S/N"
Uplink Module #1:		"P/N"	"S/N"
Uplink Module #2:		"P/N"	"S/N"
"ATCA Product Name"	Slot: 2	"P/N"	"S/N"
"AMC Product Name"	Slot: 2 AMC: B1	"P/N"	"S/N"
"AMC Product Name"	Slot: 2 AMC: B2	"P/N"	"S/N"
"AMC Product Name"	Slot: 2 AMC: B3	"P/N"	"S/N"
"AMC Product Name"	Slot: 2 AMC: B4	"P/N"	"S/N"
"ATCA Product Name"	Slot: 1	"P/N"	"S/N"
"AMC Product Name"	Slot: 1 AMC: B1	"P/N"	"S/N"
"AMC Product Name"	Slot: 1 AMC: B2	"P/N"	"S/N"
"AMC Product Name"	Slot: 1 AMC: B3	"P/N"	"S/N"
"AMC Product Name"	Slot: 1 AMC: B4	"P/N"	"S/N"

3.3.1 Power Entry Module

3.3.1.1 Dual Feed DC PEM

WARNING HAZARDOUS VOLTAGE

Before working ensure that the power is removed from the power connection cables. When the system is powered on, do NOT touch the power terminals.

WARNING

Although there are fuses in the power entry circuit of the Shelf, the power lineshave to be protected on rack level with 15 A breakers.

WARNING

Before powering the system, make sure the chassis ground (green/yellow wire) is connected to the PSU.

WARNING

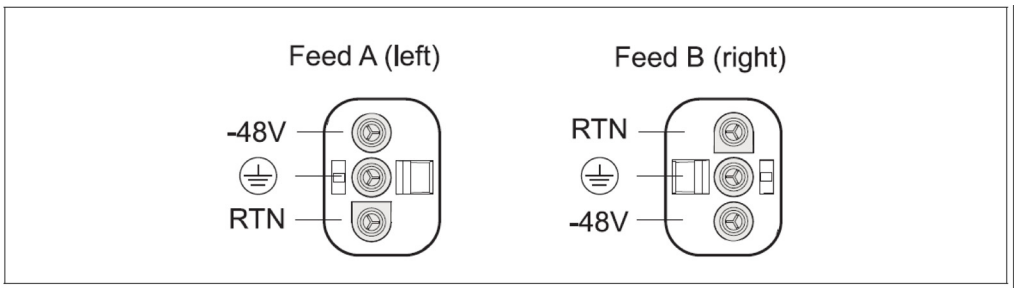
The supply voltage must be at least -40.5 VDC. Otherwise, the fans can not be operated properly.

Note:

The Shelf can be powered using a regular telecommunication power supply of -48 VDC / -60 VDC with a voltage return. The specified voltage range is from -40.5 VDC to -72 VDC.The Shelf supports redundant power sources but the two sources should be independently powered.

Two Power Inputs are located at the right and left rear side of the Shelf. Each Power Input provides a Power Input Module with EMC filter and a connector for a MOLEX HCS-125 plug. The feeds consist of a –48 VDC cable and its corresponding return cable and is protected by a 15 A fuse.

Figure 3-3:Power Input Pinout



Detailed characteristics:

- Two filtered power terminals
- -48VDC up to 450W
- Fuses below power inlet
- Fuses replaceable from the back
- No voltage/current monitoring

3.3.1.2 AC Power Entry Module (PEM) (optional)

The AC PEM is seated in the upper RTM slot. For redundancy an external AC PEM must be used.

Figure 3-4: AC Power Entry Module

Table 3-1: AC Power Entry Module Specifications

Specification	Description
Input Voltage Range	90-264V AC, 47Hz - 63 Hz
Input Current (maximum)	7.0A 2 90 V AC, 5.8A @ 180 V AC
Inrush Current	20A max. peak (per ETS 300 132-1)
Input Fuse	1 fuse 10A in line
Power Factor and Harminics	0.99 typical complies with EN61000-3-2 Class A
Efficiency	90% typical
Output Power	Constant Power: 850W (230V AC input), 500W (110V AC input)
Output Current	15.7A @ 54V (230V AC input); 9.3A @ 54V (110V AC input)
Output Voltage Range	-42V DC to -58V DC
Voltage Regulation	± 0.5% load effect; ±0.1% line effect
Output Ripple and Noise	20 kHz bandwith per ETS300132-2, CCITT 0.41 Wide band noise: max 2 mVrms psophometric; 10 mVrms non-weighted
Transient Response	Overshoot 1 V max. Recovery time: 4ms max. @ 50% load step and di/dt <0.5A /us
Start-up Time	1.5s typical (max 2.5s)
Hold-up Time	10 ms at full load
Current Limit Protection	20.3A
Short Circuit Current	25 A max.
Over Voltage Protection	-59.5 VDC Latching
Over Temperature Protection	Non latching; protection active when internal temperature is too high
Operating Temperature	-20°C to +70°C / (-4°F to +158°F) Power derating above 55°C/131°F 2% per °C; starts operation at -40°C / (-40°F)
EMI	Class B (FCC and CISPR compliant) - EN55022 level B, CE marked, Telecordia GR-63-CORE
LED Indicators	DC OK: green; AC OK: green; TEMP OK: green
Cooling	Fan cooled right to left; variable speed
Weight	approx. 1.9 kg

3.3.2 Board Installation

3.3.2.1 Board Insertion Procedures

To install the AT8402/AT8404 Carriers, proceed as follows:

1 Ensure that the safety requirements indicated in section 3.1 are observed.

2 Carefully insert the board into the slot designated by the assembly sheet until it makes contact with the backplane connectors.

3 Using the ejector handle, engage the board with the backplane. When the ejector handle is locked, the board is engaged.

4 Fasten the front panel retaining screws.

5 Connect all external interfacing cables to the board as required. Ensure that the board and all required interfacing cables are properly secured.

WARNING

Failure to comply with the instruction above may cause damage to the board or result in improper system operation. Care must be taken when applying the procedures above to ensure that no boards are physically damaged by the application of these procedures. DO NOT push the board into the backplane connectors. Use the ejector handles to seat the board into the backplane connectors.

3.3.2.2 Board Extraction Procedures

To extract the AT8402/AT8404 Carriers, proceed as follows:

1 Disconnect all external interfacing cables.

2 Unscrew the front panel retaining screws.

3 Unlock the lower handle latch, depending on the software step; this may initiate a clean shutdown of the operating system.

4 Wait until the blue LED is fully ON, this mean that the hot swap sequence is ready for board removal.

5 Use both ejectors to disengage the board from the backplane.

6 Pull the board out of the chassis.

WARNING

The Carrier boards are prepared for operation in the OM5080. It is not recommended to operate these components in a different environment (e.g. in an ATCA Chassis).

3.3.3 AMC Installation

3.3.3.1 AMC Hot Swap Insertion Procedures

The AMCs are designed for hot swap operation. Hot swapping allows the coordinated insertion and extraction of modules without disrupting other operational elements within the system. This allows for identified faulty elements to be removed and replaced without taking the Carrier card out of service that will typically be hosting others modules.

The following procedures are applicable when inserting the AMC in a running system.

1 Ensure that the safety requirements indicated in section 3.1. are observed.

WARNING

Failure to comply with the instruction below may cause damage to the board or result in improper system operation.

2 Ensure that the board is properly configured for operation in accordance with application requirements before installing.

WARNING

Care must be taken when applying the procedures below to ensure that neither the AMC nor other system boards are physically damaged by the application of these procedures.

3 To install the AMC perform the following:

1 Carefully insert the board into the slot designated by the application requirements for the board until it makes contact with the AMC Card-edge connector located on the Carrier.

2 Connect all external interfacing cables to the board as required.

3 Using the handle on the front panel, engage the board with the Carrier or backplane. When the handle is locked, the board is engaged and the following steps occur:

a The BLUE HS LED turns on.
If the Carrier recognizes that the AMC is fully seated, the Carrier then enables the management power for the AMC and the BLUE HS LED turns on.

b Long blinks of the BLUE HS LED.
If the Carrier IPMI controller detects the AMC, it sends a command to the AMC to perform long blinks of the BLUE HS LED.

c The BLUE HS LED turns off.
The Intelligent Platform Management Controller on the Carrier reads the Module Current Requirements record and the AMC Point-to-Point Connectivity record. If the Module FRU information is valid and the Carrier can provide the necessary payload power, the BLUE HS LED will be turned off. If the module FRU information is invalid or the Carrier cannot provide the necessary payload power, the insertion process is stopped and the BLUE HS LED keeps blinking. Should this problem occur, please contact Kontron's Technical Support.

d Short blinks of the Module Management LEDs and the User-Specific LEDs.
The Carrier enables the payload power for the AMC, and the Module Management LEDs and the User-Specific LEDs emit a short blink.

e Ensure that the board and all required interfacing cables are properly secured.

4 The AMCs are now ready to operate. For detailes operation of the AMCs, refer to appropriate AMC-specific software, application and documentation.

3.3.3.2 AMC Hot Swap Extraction Procedures

To extract the board proceed as follows:

1 Ensure that the safety requirements indicated in section 3.1 are observed.
Particular attention must be paid to the warning regarding the heat sink!

2 Pull the handle on the AMC's front panel initiating the deactivation. This changes the state of the handle to open. Now, the following steps occur:

1 Short blinks of the BLUE HS LED

- When the Carrier IPMI controller receives the handle opened event, the Carrier sends a command to the MMC with a request to perform short blinks of the BLUE HS LED. This indicates to the operator that the AMC is waiting to be deactivated.
- Now the AMC waits for a permission from higher level management to proceed with its deactivation.
- Once the AMC receives the permission to continue the deactivation, all used ports are disabled.
- The Intelligent Platform Management Controller on the Carrier disables the AMC's Payload Power.

2 The BLUE HS LED turns on
Now the AMC is ready to be safely extracted.

3 Disconnect any interfacing cables that may be connected to the AMC.

4 Pull the AMC out of the slot. Now the Carrier disables the management power for the AMC..

WARNING

Due care should be exercised when handling the board due to the fact that the heat sink can get very hot. Do not touch the heat sink when changing the board.

3.3.4 Management Module

The Management Module should only be removed once the chassis is completely powered down.

WARNING

Do not remove the Management Module during operation. Operation without Management Module may damage the boards.

3.3.5 Uplink Modules

The Uplink Modules are hot swappable. To remove an Uplink Module, you need to unscrew the thumb screws and pull it out. There is no hot swap LED on the Uplink Modules.

3.4 Maintenance of Equipment

A schedule should be set to verify the state of the fan filters and other components that wear out quickly (fans, etc.). The cleaning or replacement interval depends on how clean the environment is.

3.4.1 Chassis Air Filter

Filter maintenance intervals are application specific and depend on the type of equipment they are used in and the environmental conditions the equipment is subjected to. Some equipment design engineers add messages to the controlling software of their device displays to indicate when filters should be serviced based on hours of operation. Others include pressure and / or temperature sensors downstream of the filter to detect when the filter is fully loaded and needs attention. It is accepted throughout the industry for electronics equipment designers to recommend cleaning or replacing air filters approximately every 90 days.

3.4.1.1 Cleaning Methods

1 Vacuum Clean - A few passes of a vacuum cleaner will remove accumulated dust and dirt in seconds.

2 Blow with Compressed Air - Point compressed air nozzle in opposite direction of operating air flow (blow from exhaust side toward intake side).

3 Cold Water Rinse - Under normal conditions the foam media used in filters require no oily adhesives. Collected dirt is washed away quickly and easily using just a standard hose nozzle with plain water.

4 Immersion in Warm, Soapy Water - Where stubborn air-borne dirt is present, the filter may be dipped in a solution of warm water and mild detergent. Then simply rinse in clear water, let stand until completely dry and free of moisture, and return to service.

Note:

The method with compressed air (#2 above) is the fastest but may reject a lot of dust in the room.

Since air filter foam can be subjected to a variety of environments, life expectancy cannot be precisely predicted. Customer feedback indicates that controlling relative humidity between 40%-80% and temperature between 40F-90F yields an acceptable environment.

It is not recommend to store foam filters for several months or years at a time. Instead, purchase cost-effective quantities and keep adequate inventory for no more than a few months.

Chapter 4

System Management

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4. System Management

4.1 ATCA Carrier Configuration

Note:
The AT8402 and AT8404 Carriers have a special configuration matching the operation in the OM5080. They are not suited for use in a standard ATCA system.

4.1.1 Carrier Board Switch Management Login

The CLI can be accessed via serial console (using the front plate connector and provided cable or an appropriate RTM like the RTM8400) or Fast Ethernet (only via RTM). The serial console is ready to use offhand without further configuration.

To connect to the CLI via the Fast Ethernet serviceport on the RTM, a telnet session must be established to the IP address of this interface, port 23.

It is necessary to assign an IP address statically to the serviceport. Because the required configuration steps are done in the CLI, an initial access using the serial console or in-band connectivity via the Base interface is required. The procedure for assigning an IP address to the serviceport is described in the following. User input is printed in bold letters.

1 Connect to serial port on the front plate (using the provided adaptor cable) or RTM (using a RJ45 straight cable).

   Port settings are:

   - 9600 bps for the AT8402 and 115200 bps for the AT8404
   - 8 bit, no parity, 1 stop bit (8N1)
   - no flow control

2 Ensure that the board is powered up.

3 Wait for boot process to complete, i.e. until the console selection menu appears.

```
b - connect Base Fabric console
r - reset system
```

4 Type 'b' to connect to the Base Fabric console.

```
Connected to Base Fabric console
Press ^X or ^V to get to  menu again
Base Fabric switching application release BETA 1.04 starting

(Unit 1)>

User:
```

5 Log in as admin and enter privileged mode by typing 'enable' (no passwords required by default).

```
User:admin
Password:
(Ethernet Fabric) >enable
Password:

(Ethernet Fabric) #
```

6 Set IP address and netmask. (see below for an example IP address setting)

```
(Ethernet Fabric) #serviceport ip 192.168.50.107 255.255.255.0
```

The FE management interface is available from now on.

7 Save configuration by copying it to the flash, confirm by typing 'y'

```
(Ethernet Fabric) #copy system:running-config nvram:startup-config

This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Configuration Saved!

(Ethernet Fabric) #
```

To access the CLI via Fast Ethernet management port, open a telnet connection to the configured IP address, port 23.

4.1.2 Update Channel Interface (AT8402)

The Update Channel interface of the AT8402 provides a PCIe interface that is routed on the backplane between node slot 1 and node slot 2. It is composed of 4 lanes wide PCIe differential pairs and a bidirectional clock connection. The buffers on the AT8402 are disabled by default.

The customized software package for the switch management application of the AT8402 implements a script that enables these buffers regardless of the ekeying state of the update channel, because the OM5080 (T5209) doesn't implement the ekeying process.

Nevertheless the PCIe connection must be configured first, before a PCIe connection via the update channel can be used.

Note:
You can cause heavy damage to your node board and to your system if you use an AT8402 with customized software for the OM5080 outside of the OM5080.

4.1.2.1 PCIe Configuration (AT8402)

Default configuration is:

- Upstream port (root complex) at PCI Express switch PEX port 8 (AMC B2)
- No Non-transparent bridge port defined

To change the upstream port (and NT-bridge port), use the following CLI command in privileged mode:

```
set board pcie upstream <port>
```

or

```
set board pcie upstream <port> nt-bridge <port>
```

Where `<port>` can be `amcb1`, `amcb2`, `amcb3`, `amcb4` or `update`.

After changing the upstream/NT port, the PCIe subsystem requires a reset. This can be done by deactivating and activating the AT8402 Carrier.

For an overview of the current configuration, use the CLI boardinfo command:

```
(Ethernet Fabric) #show boardinfo pcie
PCIE port     Setting           Hot-Plug
==========    ================  ========
amcb1         downstream        disabled
amcb2         upstream          disabled
amcb3         downstream        disabled
amcb4         downstream        disabled
update        non-transparent   disabled

Clock setting: SSC
```

For additional information on the system configuration, see AT8402 CLI Reference Manual.

4.1.3 SAS Configuration (AT8402)

The LSISAS1064E SAS controller is pre-installed with a firmware supporting an Initiator/Target configuration. An alternative version provides integrated RAID support.

The SASx12A edge expander has appropriate configuration data pre-installed. In this default configuration, all AMC bays are connected to the SAS Expander (SAS Connect).

To establish a storage connection between AMC bays 1 and 3 instead (Direct AMC Connect), use the following command:

```
set board storage connect amcb3 amcb1
```

To reset the configuration to the default settings for bays 1 and 3, use the following command:

```
set board storage connect amcb3 sas
```

To establish a storage connection between AMC bays 2 and 4, use the following command:

```
set board storage connect amcb4 amcb2
```

To reset the configuration to the default settings for bays 2 and 4, use the following command:

```
set board storage connect amcb4 sas
```

For an overview of the current configuration, use the CLI boardinfo command:

```
(Ethernet Fabric) #show boardinfo storage
Device: amcb3   connected to storage device: sas
Device: amcb4   connected to storage device: amcb2
```

Additional information on the system configuration and on how to install the controller firmware is available as an application note upon request.

4.1.4 Clock Configuration

The AT8402 Carrier board allows to setup the AMC clocks in many ways. Configuration of the clock settings will be shown with the command

```
show boardinfo clock amc
```

This command shows the configuration of the AMC clocks. The AMC clocks are displayed with the source (from Carrier or AMC), state (enabled/disabled) and (if enabled) the internal clock index with clock configuration attributes. If the source is the AMC, it is checked whether an AMC is present (otherwise state is set to 'not present').

For source AMC the AMC is queried with the get clock state command and if the IPMI command is not supported the state is set to '--'. For source Carrier the clock state is queried from the local on-Carrier device where the AMC clock is connected to.

For additional information about clock settings, see AT8402 CLI Reference Manual.

4.1.5 IPMI over LAN Management Interfaces

The AT8402 and AT8404 provide an IPMI over LAN (RMCP) interface through their Base Interface.

4.1.6 Ethernet System Setup

4.1.6.1 AT8402

Table 4-1:OM5080-1G Node 1/2 Ethernet Switch Port Assignment

CLI ID	Speed	Type	Connection
0/1	1 GbE	1000BaseT	RTM GE1 (optional)
0/2	1 GbE	1000BaseT	RTM GE2 (optional)
0/3	1 GbE	1000BaseT	Uplink Base 2
0/4	1 GbE	1000BaseT	Uplink Base 1
0/5	1 GbE	Serdes	N.C.
0/6	1 GbE	Serdes	N.C.
0/7	1 GbE	Serdes	Uplink Fabric SFP2
0/8	1 GbE	Serdes	Uplink Fabric SFP1
0/9	1 GbE	Serdes	AMC B4 Port 0
0/10	1 GbE	Serdes	AMC B4 Port 1
0/11	1 GbE	Serdes	AMC B3 Port 0
0/12	1 GbE	Serdes	AMC B3 Port 1
0/13	1 GbE	Serdes	AMC B2 Port 0
0/14	1 GbE	Serdes	AMC B2 Port 1
0/15	1 GbE	Serdes	AMC B1 Port 0
0/16	1 GbE	Serdes	AMC B1 Port 1
0/17	1 GbE	Serdes	Node 2/1 0/17*
0/18	1 GbE	Serdes	Node 2/1 0/18*
0/19	1 GbE	Serdes	Node 2/1 0/19*
0/20	1 GbE	Serdes	Node 2/1 0/20*
0/21	1 GbE	Serdes	Node 2/1 0/21*
0/22	1 GbE	Serdes	Node 2/1 0/22*
0/23	1 GbE	Serdes	Node 2/1 0/23*
0/24	1 GbE	Serdes	Node 2/1 0/24*

4.1.6.2 AT8404

Table 4-2:OM5080-10G Node 1/2 Ethernet Switch Port Assignment

CLI ID	Speed	Type	Connection
0/1	1 GbE	Serdes	AMC B1, Port 8
0/2	1 GbE	Serdes	AMC B1, Port 9
0/3	1 GbE	Serdes	AMC B1, Port 10
0/4	1 GbE	Serdes	AMC B1, Port 11
0/5	1 GbE	Serdes	AMC B1, Port 0
0/6	1 GbE	Serdes	AMC B2, Port 8

CLI ID	Speed	Type	Connection
0/7	1 GbE	Serdes	AMC B2, Port 9
0/8	1 GbE	Serdes	AMC B2, Port 10
0/9	1 GbE	Serdes	AMC B2, Port 11
0/10	1 GbE	Serdes	AMC B2, Port 0
0/11	1 GbE	Serdes	AMC B3, Port 8
0/12	1 GbE	Serdes	AMC B3, Port 9
0/13	1 GbE	Serdes	AMC B3, Port 10
0/14	1 GbE	Serdes	AMC B3, Port 11
0/15	1 GbE	Serdes	AMC B3, Port 0
0/16	1 GbE	Serdes	AMC B4, Port 8
0/17	1 GbE	Serdes	AMC B4, Port 9
0/18	1 GbE	Serdes	AMC B4, Port 10
0/19	1 GbE	Serdes	AMC B4, Port 11
0/20	1 GbE	Serdes	AMC B4, Port 0
0/21	1 GbE	1000BaseT	On-board Unit Computer
0/22	1 GbE	Serdes	RTM SFP (optional)
0/23	1 GbE	1000BaseT	Uplink Base 2
0/24	1 GbE	1000BaseT	Uplink Base 1
0/25	10 GbE	XAUI	Node 2/1 0/25*
0/26	10 GbE	XAUI	Uplink Fabric SFP+

* connected to same port of other node

4.1.6.3 Default Configuration

In order to recover the system's factory settings, the default configuration script must be applied. This script is available in the Default Configuration section of the OM5080 product web page. Instructions on how to apply the script are covered in application note: AN09007 - AT8404 - Configuration script which is available on the AT8404 product web page or AN09008 - AT8402 Configuration script which is available on the AT8402 product web page.

4.2 Management Module.

Note:
The current Management Module firmware implementation does not implement all the PICMG 3.0 R2.0 shelf management requirements. Applications and node boards that rely on full shelf manager capability, e.g. electronic keying, power management, global system event log, consolidated shelf sensor device record repository (SDRR), etc. may need firmware modifications to work in an OM5080.

4.2.1 Node Board Activation and Deactivation

The Management Module handles automatic board activation and deactivation of AdvancedTCA node boards. It monitors the PICMG state machine and associated transitions for board activation (transitions from M0 to M4) and deactivation (transitions from M4 to M6).

This includes handling of the hotswap events sent from the node boards, as well as sending needed IPMI commands for activation.

The Management Module does not calculate the ekeying states for the backplane interconnects and doesn't send "SetPortState(enable/disable)" commands.

4.2.2 Chassis FRU Information

The Management Module reads and provides access to the FRU data of the backplane, stored in the backplane FRU data EEPROM, and to the FRU data information of the optional Uplink Modules. This FRU data is represented using standard IPMI/PICMG FRU data records.

The Management Module implements access to following FRUs data storages.

Table 4-3:FRU ID Description

FRU ID	Description
00h	Local FRU data including board info,
80h	FRU data of uplink module #1
90h	FRU data of uplink module #2
FEh	Shelf FRU data located on the backplane

4.2.3 Sensors and Event Log

The Management Module implements its own local persistent System Event Log (SEL) and acts as event receiver for events issued by the node boards.

This local SEL, in addition to the node board persistent local SEL provides information on current and past events.

4.2.4 Management Interfaces

The OM5080 provides different management interfaces. The main access point for interfacing to a system manager application is using IPMI over LAN (RMCP protocol). The RMCP termination is done on the integrated AdvancedMC Carrier Node boards. They can bridge RMCP requests to either the local IPMC of the Carrier board, or to the SMC on the Management Module, using the redundant backplane IPMB-0.

In addition, management access is also possible from any AMC module, using the IPMB-L connected to the AMC and using bridged messages to either the Carrier IPMC or the SMC on the Management Module.

Using RMCP for management access is very similar to accessing a standard AdvancedTCA shelf manager.

However, since the system does not contain a dedicated Shelf Manager entity, a system manager needs to be aware of the topology of the OM5080 and needs to manage both node boards independently as ATCA node boards.

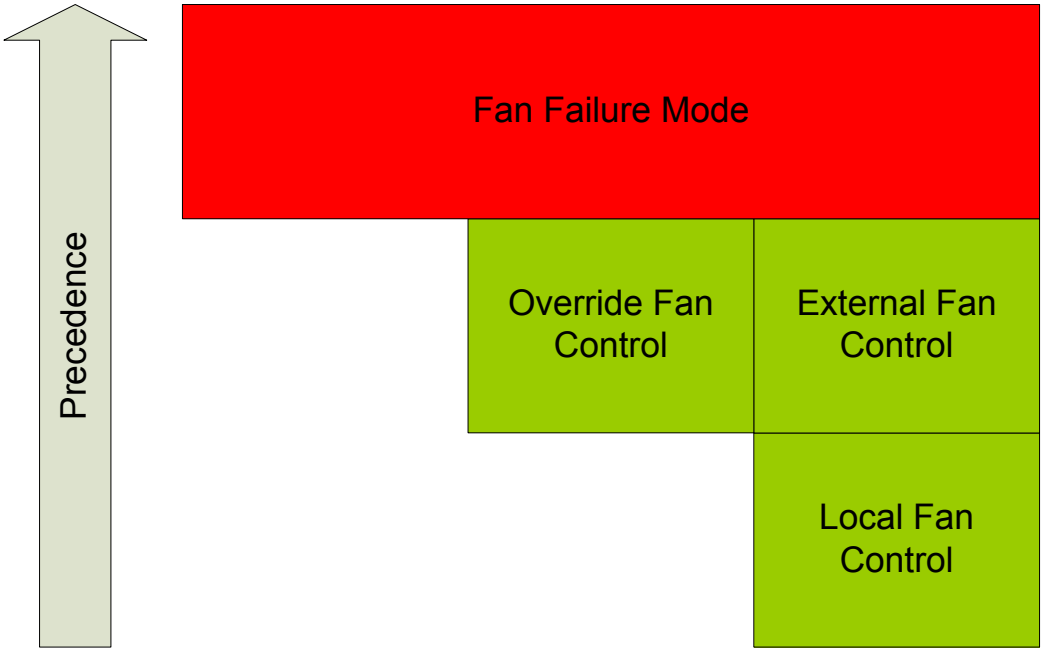
The Management Module contains system alarm I/Os, fan control and inventory data as well as its own system event log (SEL) and system sensor information can be accessed via both node boards.

4.2.5 Fan Control

The SMC on the Management Module monitors and controls the two fan trays of the OM5080.

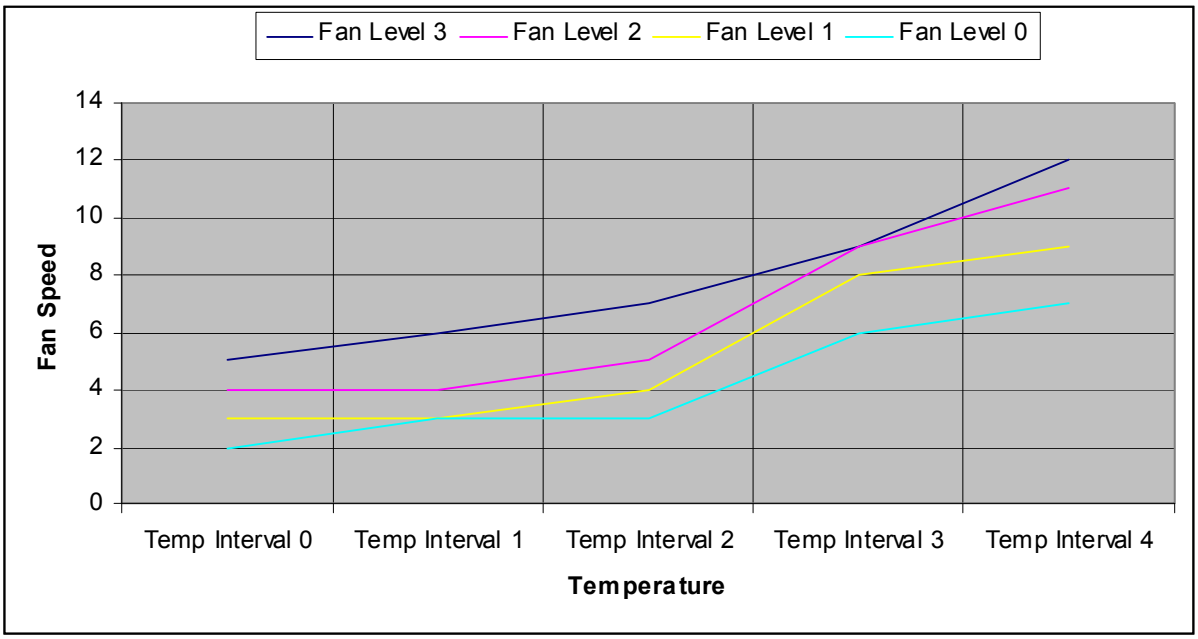
The fans can operate in four different modes called “Local Fan Control” mode, “Override Fan Control” mode, “External Fan Control” mode and “Fan Failure” mode. During each of these modes the SMC translates the temperature read from the chassis air inlet temperature sensor into a fan speed. This translation depends on the current fan level.

Figure 4-1:Fan Control Modes



- The SMC powers up in "Local Fan Control” mode.
- "Fan Failure” mode has precedence over all other modes.
- The fan speed associated with a fan level is configurable using fan control records in the backplane FRU data EEPROM.
- Each Fan Level is related to a temperature interval defined in the fan control FRU data records.
- If the SMC is in Fan Failure mode all attempts to change the mode to “Override Fan Control” mode or “External Fan Control” mode are rejected with the completion code D5h.

Figure 4-2:Example Relationship between Temperature, Fan Level and Fan Speed



4.2.5.1 External Fan Control Mode

In "External Fan Control" mode external software is responsible to compute the fan level that is needed to cool the OM5080. Therefore the chassis is splitted into two cooling domains. Each cooling domain represents one of the two AdvancedTCA slots including all managed sub FRUs.

The Management Module enters "External Fan control" mode if it received at least the "SetExternalFanControl" OEM command for one cooling domain. If it receives the "SetExternalFanControl" OEM command for both cooling domains it selects the highest fan as the actual one.

- The Management Module enters "External Fan Control" mode if it receives the "Set External Control Mode (enable)" command for at least one "Cooling Domain".
- The Management Module leaves "External Fan Control" mode if it receives for both "Cooling Domains" the "Set External Control Mode (disable)" command.
- The "Set External Fan Control Mode (enable)" command is expected to be received at regular intervals.
- Upon expiration of a timeout on the "Set External Fan Control Mode (enable)" command the SMC assumes a "Set External Fan Control Mode (disable)" command.
- If the Management Module receives the "Set External Fan Control Mode (enable)" command only for one of the two cooling domains, "Normal Fan Level" will be used for the second one.
- The Management Module selects the highest Fan Level sent from each cooling domains as the current fan level.

4.2.5.2 Override Fan Control Mode

"Override Fan Control" mode can be used to adjust the fan level for laboratory, debug, maintenance or similar use. In that mode the standard PICMG "SetFanLevel" command can be used to adjust the current fan level.

4.2.5.3 Fan Failure Mode

The Management Module automatically switches to "Fan Failure" mode if one of the following conditions is met:

- at least one fan trays is not present
- the Management Module is not operational
- the Management Module cannot read the Cooling Record is present from its local FRU data storage

The red fan status LEDs on the front panel of the Management Module indicates that "Fan Failure" mode is active. The "Fan Failure" mode takes precedence over all other fan modes.

4.2.6 Using the Fan Control Application

In addition to the autonomous fan control implemented on the Management Module Kontron provides a sample fan control application that uses "external control" mode. It computes the desired fan level according to local temperature readings on the node boards, similar to the way a standard AdvancedTCA shelf manager provides fan control based on temperature readings and threshold events. Therefore the application periodically sends the computed fan level to the SMC for the local cooling domain using the "Set External Fan Control" OEM command.

The fan control application runs on each local control processor of the Carrier boards. It is disabled by default.

4.2.6.1 Cooling Concept

The fan control application periodically polls the current node board temperature sensors and checks if the sensor reading value crossed the sensors threshold values.

If at least one temperature sensor crossed its threshold the current fan level is increased by one. The fan level is decreased by one if all temperature sensors values are in their normal range for for a specified time interval.

4.2.6.2 Configuration

The template of a configuration file "fan-settings.template" is located in the "/opt/om5080/etc/" directory and should be copied to the directories "/mnt/os/fan-settings" on AT8404 boards and "/config/base/fan-settings" on AT8402 boards to take effect.

```
###
### Copy this file to "/mnt/os/fan-settings" directory on AT8404 boards
### or to "/config/base/" directory  to modify the behaviour of
### fan control application.
###

### FAN_CONTROL
### Set this option to "yes" to enable fan control
#FAN_CONTROL="yes"

### FAN_XXXX_LEVEL
### Setting these options to a fan level overrides defaults
### read from FRU data
#FAN_MIN_LEVEL=""
#FAN_MAX_LEVEL=""
#FAN_NORM_LEVEL=""

### FAN_POLL_TIMEOUT
### Poll the cooling state of the blade every xx seconds. The
### default value is 30.
#FAN_POLL_TIMEOUT="30"

### FAN_DECREASE_TIMEOUT
### Decrease the fan level every xx seconds when in normal
### cooling state. FAN_DECREASE_TIMEOUT should be a multiple
### of FAN_POLL_TIMEOUT. The default value is 180.
#FAN_DECREASE_TIMEOUT="180"

### FAN_CONTROL_DEBUG
### Set this option to "yes" to enable debug output
FAN_CONTROL_DEBUG="no"
```

Table 4-4:Fan Control Settings

Setting	Parameter	Description
FAN_CONTROL	“yes”/”no”	If set to yes the fan application is started during startup of the node board.
FAN_MIN_LEVEL	fan level (integer)	Lowest fan level that can be reached if there are no temperature events.
FAN_MAX_LEVEL	fan level (integer)	Highest available fan level.
FAN_NORM_LEVEL	fan level (integer)	Fan level after startup of the application.
FAN_POLL_TIMEOUT	seconds (integer)	Fan Application polls every x seconds for temperature events.
FAN_DECREASE_TIMEOUT	seconds (integer)	Fan Application decreases fan level every x seconds if no temperature events. This value shall be a multiple of FAN_POLL_TIMEOUT
FAN_CONTROL_DEBUG	“yes”/”no”	Be more verbose if set to yes.

4.2.7 Telco Alarm Management

The SMC provides Telco Alarm support for control by an external System Manager. It does not by itself provide shelf management functionality to control Telco Alarms. The following sections describe the various Telco related IPMI commands that the SMC responds to or generates.

4.2.7.1 "Get Telco Alarm Capability" Command

The external System Manager can gather the Telco alarm state by sending a "Get Telco Alarm State"command to the SMC. This command is described in Table 4-5.

Table 4-5:"Get Telco Alarm Capability" Command

	Byte	Data Field
Request Data	1	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.
	2	FRU Device ID. A value of 00h shall be used.
Response Data	1	Completion Code.
	2	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.
	3	Alarm Capabilities [7] -Autonomous Major Reset [6] -Autonomous Minor Reset [5] -Autonomous alarm cutoff [4] -Test Mode can be enabled by the "Set Telco Alarm State" command. [3] -Power Alarm -alarm can be controlled by the "Set Telco Alarm State" command. [2] -Minor Alarm -alarm can be controlled by the "Set Telco Alarm State" command. [1] -Major Alarm -alarm can be controlled by the "Set Telco Alarm State" command. [0] -Critical Alarm -alarm can be controlled by the "Set Telco Alarm State" command.

4.2.7.2 "Set Telco Alarm State" Command

Using the Telco Alarms feature on the OM5080 requires an external System Manager to determine the collective health of the OM5080, which can send a "Set Telco Alarm State" command to the SMC to activate Telco LEDs and alarm relays. This command is described in Table 4-6.

Table 4-6:"Set Telco Alarm State" Command

	Byte	Data Field
Request Data	1	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.
	2	FRU Device ID. A value of 00h shall be used.
	3	Alarm ID. 00h = Critical Alarm. 01h = Major Alarm. 02h = Minor Alarm. 03h = Power Alarm. 04h = Alarm Cutoff. 05h-FFh are reserved.
	4	Alarm Control. 00h = set to "off / cutoff disabled" 01h = set to "on / cutoff enabled" Other values are reserved
Response Data	1	Completion Code.
	2	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.

4.2.7.3 "Get Telco Alarm State" Command

The external System manager can gather the Telco Alarm state by sending a "Get Telco Alarm State" command to the SMC. This command is described in Table 4-7.

Table 4-7:"Get Telco Alarm State" Command

	Byte	Data Field
Request Data	1	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.
	2	FRU Device ID. A value of 00h shall be used.
	3	Alarm ID 00h = Critical Alarm. 0 h = Major Alarm. 0 h = Minor Alarm. 0 h = Power Alarm. 0 h = Alarm Cutoff. 0 h-FFh are reserved.
Response Data	1	Completion Code.
	2	PICMG Identifier. Indicates that this is a PICMG-defined group extension command. A value of 00h shall be used.
	3	Alarm Control. 00h = "off / cutoff disabled" 01h = "on / cutoff enabled" Other values are reserved

4.2.7.4 "Telco Alarm Input" Sensor and Event Message

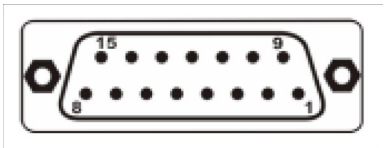
The SMC sends an event message to the event receiver, as described in Table 4-8 "Telco Alarm Input" event message, when the Telco connector Minor Reset, Major Reset inputs change state, or when the Alarm Reset button is held for more than 1 second, indicating the state of these inputs in the event message.

Table 4-8:"Telco Alarm Input" Event Message

	Byte	Data Field
Request Data	1	Event Message Rev = 04h
	2	Sensor Type = F4h (Telco Alarm Input)
	3	Sensor Number
	4	Event Direction [7] = 0b (Assertion), 1b (De-assertion) Event Type [6:0] = 6Fh (Sensor Specific)
	5	Event Data 1 [7:6] = Event Data 2 Format 00h = Event Data 2 not specified. Other values reserved. [5:4] = Event Data 3 Format 00h = Event Data 3 not specified. Other values reserved. [3:0] -offset 2h = Alarm Cutoff 1h = Major Reset 0h = Minor Reset All other values are reserved.
	6	Event Data 2 = FFh
	7	Event Data 3 = FFh
Response Data	1	Completion Code

4.2.7.5 Telco Alarm Connector

Figure 4-3:Telco Alarm Connector



The SMC Alarm connector pin-out is described in the following table:

Table 4-9:Telco Alarm Connector Pinout

Pin #	Pin Name	Direction	Name Description
1	AMIR+	IN	Minor Reset+
2	AMIR	IN	Minor Reset
3	AMAR+	IN	Major Reset+
4	AMAR	IN	Major Reset#
5	ACNO	OUT	Critical Alarm - Normal Open
6	ACNC	OUT	Critical Alarm -Normal Closed
7	ACCOM	OUT	Critical Alarm -Common
8	AMINO	OUT	Minor Alarm - Normal Open
9	AMINC	OUT	Minor Alarm -Normal Closed
10	AMINCOM	OUT	Minor Alarm -Common
11	AMANO	OUT	Major Alarm - Normal Open
12	AMANC	OUT	Major Alarm -Normal Closed
13	AMACOM	OUT	Major Alarm -Common
14	APRCO	OUT	Pwr Alarm - Normal Open
15	APRCOM	OUT	Pwr Alarm -Common
Shield	Shelf-GND		Shelf Ground

Chapter 5

Updating the System

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5. Updating the System

There are different parts of the OM5080 that can be updated, mainly the AT8402 or AT8404 carrier boards, and AMC's (if applicable).

5.1 AT8402 Firmware Administration

A running AT8402 system requires – after the bootloader has passed control to the kernel – the kernel itself, the root file system, the FASTPATH switching application and a configuration file for the base switch. Kernel, applications and RootFS are aggregated into an initrd-image. These software components, together with the IPMC image, make up the AT8402 firmware.

The flash holding the AT8402 software is divided into seven partitions. There are partitions to store two bootloader and two software images. Two partitions are reserved for the (redundant) bootloader environment and one partition is used to hold up to 99 configuration setting files. The software partitions hold a combined kernel and initrd image as well the application software which is part of the initrd. The partition scheme of the flash is shown below:

Table 5-1:FLASH Partition Scheme(32MB)

Partition	Size [MB]	MTD	Partition name
U-Boot Loader primary image	256KB	6	u-boot_P
U-Boot Loader secondary image, updatable	256KB	5	u-boot_S
U-Boot primary environment	256KB	4	u-boot_envA
U-Boot secondary environment	256KB	3	u-boot_envB
Software image secondary partition	14MB	2	image_B
Software image primary partition	14MB	1	image_A
JFFS2 Configuration File Partition	3MB	0	config

The firmware update procedure is designed to provide a failsafe capability to update IPMC, software and configuration settings separately. Each combination of these components can be used as a startup configuration, though they must be compatible to each other. Please always follow Kontron documentation for all your upgrades. Software versions provided with an official release are known to work together.

In the following, the CLI commands to setup, change and activate startup configuration and the CLI commands necessary to perform firmware upgrades are described. The CLI commands described below are executed in the privileged mode of the CLI hierarchy, which is entered by executing the 'enable' command. Please refer to [1] for more information regarding the CLI commands and the way to use them.

5.1.1 Startup Configurations

A startup configuration is a combination of an initrd and a configuration file for the base switch. The IPMC image is not part of the configuration and is updated separately. Several configurations (up to 99) can be defined but only one is active at a time. To display the currently available startup configurations, the CLI command 'show' is used.

```
(AT8402 Base Fabric) #show startupconfig startup

ACT NR INITRD       CONFIG
--- -- ------------ ------------
    01 A ALPHA 6.01 01 standard
 *  02 A ALPHA 6.01 02 config

(AT8402 Base Fabric) #
```

In this example, three startup configurations are available. Startup configuration 02 is the currently active configuration which is indicated by the '*' in the first column. This configuration consists of:

- INITRD ALPHA 6.01 which is located in Software partition A.
- Base fabric configuration file which is stored in slot 02 of the configuration partition.

The user can define other startup configurations and combine images and configuration files as needed. To set up a new startup configuration, it is necessary to change into the CLI's configuration mode using the 'configure' command. In this mode, the 'startupslot' command is used as shown in the following example:

```
(AT8402 Base Fabric) (Config)#startupslot 3 config 2 initrd A

Successfully set startup slot 3
You may mark it active now and reboot to use the new configuration.

(AT8402 Base Fabric) (Config)#exit

(AT8402 Base Fabric) #show startupconfig startup

ACT NR INITRD       CONFIG
--- -- ------------ ------------
    01 A ALPHA 6.01 01 standard
 *  02 A ALPHA 6.01 02 config
    03 A ALPHA 6.01 02 config

(AT8402 Base Fabric) #
```

A new startup configuration has been added to the list combining the software images given in the previous command.

WARNING

It is not recommended to combine images from different releases.

The startup configuration created before can be deleted by entering exactly the same command string proceeded by 'no':

```
(AT8402 Base Fabric) (Config)#no startupslot 3 config 2 initrd A
```

The ‘show’ command can also be used to display available versions of initrd. The syntax is:

```
show startupconfig initrd
```

The configuration mode is also used to activate one of the available startup configurations. The syntax is:

```
startupslot 3 activate [once]
```

This command would activate the startup configuration 3 upon next system reset. The optional parameter ‘once’ would start configuration 3 only once after the next system reset and start the previously active configuration 2 on following resets. This is used to implement the failsafe upgrade procedure described below.

5.1.2 Updating Firmware

The firmware - except bootloader and IPMC image - is updated using the CLI. To get a reliable and failsafe update procedure, the following precautions must be fulfilled:

- Two independent partitions, one holds system A initrd and one holds system B initrd. The active system is either system A or system B. See the flash partition scheme shown above for more detail.
- One Time Boot capability: After having updated the inactive kernel and root file system, the new system has to be started by rebooting the board. In case of the update having installed an inoperable system which would cause the board to hang when booting, the next board reset will restart the previous known good version of the system. This is achieved by programming the bootloader environment appropriately.
- Redundant bootloader environment sectors: When the system is updated, the bootloader environment must be changed to be able to start the updated version. The bootloader environment sector is stored twice in flash, one active version and one backup version in case the active version is deleted during update due to power loss or similar errors. In this case, the redundant environment would cause the bootloader to start the previous known good version of the system.

A software update of the AT8402 Carrier Board is done by performing the following steps:

1. Download initrd image into the appropriate slot of the flash memory. Ensure that the currently active images are not overwritten.
2. Select a configuration for base switch for the new software release. This can be done by choosing the factory default or by storing the running system configuration into flash.
3. Create a startup configuration by combining the slots with the update images and the configuration slots for base and fabric switch.
4. Activate the selected startup configuration for One Time Boot.
5. Restart the board.
6. Activate the new startup configuration permanently

A software release for the AT8402 consists of one software package, initrd. The package is a tar archive containing an image of the software and a MD5 checksum file for consistency check. The name of the package file is arbitrary but the file names in the archive must not be altered.

When performing a firmware update, the software packages are loaded from a remote TFTP server in the first step. To load a software package via TFTP into a specified slot, the CLI command 'download' is used:

```
(AT8402 Base Fabric) #download initrd tftp://192.168.50.5/kernel.pkg B

Downloading image, this may take a while...
Successfully transferred initrd image tftp://192.168.50.5/initrd.pkg to slot 2
You may mark it active now and reboot to use the new initrd image.

(AT8402 Base Fabric) #
```

This downloads the specified initrd package file via TFTP and writes the image into the partition of the specified slot (B). The CRC32 checksum of the image is checked while writing it into flash. It is important **not** to overwrite the slots containing the currently active software, otherwise the One Time Boot mechanism does not make sense. In case of an error the partition will be deleted and the old image will be used to reboot the system

After the software image has been downloaded into flash, the configuration slot for the base switch must be selected. In case that no appropriate configuration for the base switch is available, the factory default configuration should be used for the startup configuration of the new software release. Alternatively, the running configuration settings of base switch can be stored on flash using the following CLI command:

```
(AT8402 Base Fabric) #copy system:running-config nvram:startup-config

This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n) y

Configuration Saved!

(AT8402 Base Fabric) #
```

Finally, a startup configuration containing the slots of the new software release and the configuration slots must be selected or a new startup configuration must be created as described above. After this step has been completed, the startup configuration is activated only for the next boot and the board is rebooted. This is done with the 'startupslot' CLI command in the configure mode:

```
(AT8402 Base Fabric) (Config)#startupslot 3 activate once
```

This command enables the startup configuration 3 only for the next system restart. In the case that the board hangs due to a corrupted software image, this will be detected and the board is automatically rebooted with the previous known good startup configuration. This way, a failsafe upgrade of the AT8402 software is possible.

To restart the board with the new startup configuration, the CLI command 'reload' is used:

```
(AT8402 Base Fabric) (Config)#reload
```

If the new startup configuration is considered functional after the reboot, it must be activated permanently, or else the one that is still active will be used again:

```
(AT8402 Base Fabric) (Config)#startupslot 3 activate
```

5.1.3 Updating AT8402 IPMI FW

Updating the IPMI firmware is different from updating the other software parts as updating is done directly when invoking the download command. In case that the update procedure fails or the update image is corrupted, the IPMC will be able to restart all the same by means of its rollback functionality. The IPMI software package file is stored in the result/ppc405/firmware path of the release directory tree. To update the IPMI firmware, the CLI command 'download' is used:

```
(Ethernet Fabric) #download ipmifw tftp://192.168.50.5/ipmi.pkg

Flashing a new IPMI firmware will disable the IPMI Controller for some minutes.
Are you sure to update the IPMI firmware? (y/n)y
...

(Ethernet Fabric) #
```

5.2 AT8404 Firmware Administration

A running AT8404 system requires – after the bootmonitor has passed control to the kernel – the kernel itself, the root file system and the FASTPATH switching application. Kernel, applications, RootFS and bootmonitor are aggregated into an initrd-image. These software components, together with the IPMC image, make up the AT8404 firmware.

The flash holding the AT8404 software is divided into nine partitions. The highest partition (mtd8), holding the basic boot initialization code can be hardware protected to assure not to be overwritten by any update procedure. There are two software partitions (mtd3, mtd7) holding a combined kernel, initrd and bootmonitor image as well the application software which is part of the initrd. Four partitions are reserved for a pair of redundant bootloader environment for each image. The partition scheme of the flash is shown below:

Table 5-2:FLASH Partition Scheme(256MB)

Partition	Size [MB]	Start Address	End Address	Partition name
mtd8	0.25	FFFC0000	FFFFFFFF	Boot initialization code (U_Boot, write protected by hardware setting
mtd7	0.25	FFF80000	FFFBFFFF	SW0 - boot monitor image (U-Boot) Note (4)
	0.25	FFF40000	FFF7FFFF	SW0 - Copy of boot monitor image for SW1 (U-Boot) Note (4)
	40.75	FD680000	FFF3FFFF	SW0 - OS Image Note (1)
mtd6	86.00	F8080000	FD67FFFF	SW0 - Non-volatile storage area (JFFS2) Note (2)
mtd5	0.25	F8040000	F807FFFF	SW0 - Redundant U-Boot environment A Note (3)
mtd4	0.25	F8000000	F803FFFF	SW0 - Redundant U-Boot environment B Note (3)
	0.25	F7Fc0000	F7FFFFFF	Unused
mtd3	0.25	F7F80000	F7FBFFFF	SW0 - boot monitor image (U-Boot) Note (4)
	0.25	F7F40000	F7F7FFFF	SW1 - Copy of boot monitor image for SW0 (U-Boot) Note (4)
	40.75	F5680000	F7F3FFFF	SW1 - OS Image Note (1)
mtd2	86.00	F0080000	F567FFFF	SW1 - Non-volatile storage area (JFFS2) Note (2)
mtd1	0.25	F0040000	F007FFFF	SW1 - Redundant U-Boot environment A Note (3)
mtd0	0.25	F0000000	F003FFFF	SW1 - Redundant U-Boot environment B Note (3)

Note:

Note (1): The board does support OS images up to 40,75 MB size.

Note (2): Note that only the flash partitions mtd2 and mtd6 are using the JFFS2 file system for storage. All other flash partitions are not formatted and accessible from Linux only as raw devices.

Note (3): The U-Boot boot loader uses one flash sector for storing its environment variables. These can be saved and manipulated from the U-Boot CLI and using Linux tools. To enable atomic updates of the environment variables, U-Boot uses redundant environment sectors; in case of a failure in completely writing the current sector (e.g. due to loss of power or reset during writes), it will automatically use the redundant environment. Therefore each boot monitor uses two flash sectors (partitions) for storing its environment and redundant copy.

Note (4): The boot monitor is different for firmware image 0 and firmware image 1. This is because early parts of the boot monitor have to be relocated at build time for the address they execute from. Therefore both firmware images (SW0 and SW1) contain boot monitor images able to execute on any of the possible addresses. This allows for doing a verbatim copy of SW0 to SW1 and vice versa.

5.2.1 Updating Firmware

The firmware - including bootloader - image is updated using the CLI. To get a reliable and failsafe update process, follow the indications supplied in the Firmware section of the AT8404 product web page.

5.3 AMCs Update

For additional information about updating the AMCs refer to the appropriate documentation.

5.3.1 Updating IPMI FW of an AMC

There is also a possibility to update the IPMI FW of any AMC plugged into an AMC slots. Pre-requisite is an HPM.1 compatible format of the IPMI FW update image

To do the update use the CLI command (example updating AMC FW plugged into slot B1):

```
(Ethernet Fabric) #download amcipmifw tftp://192.168.50.5/ipmi.pkg amcb1

Flashing a new IPMI firmware will disable the IPMI Controller for some minutes.
Are you sure to update the IPMI firmware? (y/n)y
...
(Ethernet Fabric) #
```

A. Getting Help

If, at any time, you encounter difficulties with your application or with any of our products, or if you simply need guidance on system setups and capabilities, contact our Technical Support at:

North America	EMEA
Tel.: (450) 437-5682	Tel.: +49 (0) 8341 803 333
Fax: (450) 437-8053	Fax: +49 (0) 8341 803 339

If you have any questions about Kontron, our products, or services, visit our Web site at: www.kontron.com

You also can contact us by E-mail at:

North America: support@ca.kontron.com

EMEA: support-kom@kontron.com

Or at the following address:

North America	EMEA
Kontron Canada, Inc.	Kontron Modular Computers GmbH
4555, Ambroise-Lafortune	Sudetenstrasse 7
Boisbriand, Québec	87600 Kaufbeuren
J7H 0A4 Canada	Germany

A.1 Returning Defective Merchandise

Before returning any merchandise please do one of the following:

- Call

    1 Call our Technical Support department in North America at (450) 437-5682 and in EMEA at +49 (0) 8341 803 333. Make sure you have the following on hand: our Invoice #, your Purchase Order #, and the Serial Number of the defective unit.

    2 Provide the serial number found on the back of the unit and explain the nature of your problem to a service technician.

3 The technician will instruct you on the return procedure if the problem cannot be solved over the telephone.

4 Make sure you receive an RMA # from our Technical Support before returning any merchandise.

- E-mail

1 Send us an e-mail at: RMA@ca.kontron.com in North America and at: orderprocessing@kontron-modular.com in EMEA. In the e-mail, you must include your name, your company name, your address, your city, your postal/zip code, your phone number, and your e-mail. You must also include the serial number of the defective product and a description of the problem.

A.2 When Returning a Unit

- In the box, you must include the name and telephone number of a contact person, in case further explanations are required. Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.
- Ensure that the unit is properly packed. Pack it in a rigid cardboard box.
- Clearly write or mark the RMA number on the outside of the package you are returning.
- Ship prepaid. We take care of insuring incoming units.

North America	EMEA
Kontron Canada, Inc.	Kontron Modular Computers GmbH
4555, Ambroise-Lafortune	Sudetenstrasse 7
Boisbriand, Québec	87600 Kaufbeuren
J7H 0A4 Canada	Germany

B. Glossary

Acronyms	Descriptions
ACPI	Advanced Configuration & Power Interface
AdvancedMC	(Same as AMC). Advanced Mezzanine Card.
AMC	(Same as AdvancedMC). Advanced Mezzanine Card.
AMC.0	Advanced Mezzanine Card Base Specification.
AMC.1	PCI Express and Advanced Switching on AdvancedMC. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
AMC.2	Ethernet Advanced Mezzanine Card Specification. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
AMC.3	Advanced Mezzanine Card Specification for Storage. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
ATCA	Advanced Telecommunications Computing Architecture
BI	Base Interface. Backplane connectivity defined by the ATCA.
BIOS	Basic Input/Output System
CLI	Command-Line Interface
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
ESD	ElectroStatic Discharge
FI	Fabric Interface. Backplane connectivity defined by the ATCA.
FRU	Field Replaceable Unit. Any entity that can be replaced by a user in the field. Not all FRUs are hot swappable.
Gb	Gigabit
GB	(Same as GByte) GigaByte.
GByte	(Same as GB) GigaByte.
GbE	Gigabit Ethernet
HPM	PICMG Hardware Platform Management specification family
HPM.1	Hardware Platform Management IPM Controller Firmware Upgrade Specification
I²C	Inter Integrated Circuit bus
IO	(Same as I/O). Input Output
I/O	(Same as IO). Input Output
IOL	IPMI-Over-LAN
IP	Internet Protocol
IPM	Intelligent Platform Management
IPMB	Intelligent Platform Management Bus
IPMB-0	Intelligent Platform Management Bus Channel 0, the logical aggregation of IPMB-A and IPMB-B.
IPMB-A	Intelligent Platform Management Bus A
IPMB-B	Intelligent Platform Management Bus B
IPMB-L	Intelligent Platform Management Bus Local
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface
LAN	Local Area Network

Acronyms	Descriptions
LED	Light-Emitting Diode
MAC	Media Access Controller address of a computer networking device.
MB	MegaByte
MHz	MegaHertz
MMC	Module Management Controller. MMCs are linked to the IPMC.
MTBF	Mean Time Between Failures
OS	Operating System
PEM	Power Entry Module
PICMG	PCI Industrial Computer Manufacturers Group
PICMG®	PCI Industrial Computer Manufacturers Group
RoHS	Restriction of the Use of Certain Hazardous Substances
RS-232	(Same as RS232). Recommended Standard 232.
RS232	(Same as RS-232). Recommended Standard 232.
RTM	Rear Transition Module
SAS	Serial Attached SCSI
SATA	Serial ATA
SEL	System Event Log
SFP	Small Form-factor Pluggable
SMC	System Management Controller for the Management Module.